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Contribution to American Bryology—XI.

BY ELIZABETH G. BRITTON.

I. COSCINODON RAUI AND COSCINODON RENAULDI.

(PLATE 248.)

Owing to the fact that the upper part of the leaf in *Coscinodon* is colorless, it has happened that in the first descriptions of both *C. Wrightii* and *C. Raui*, the vein has been described as ending below the apex. In describing *C. Wrightii* Sullivant said of the leaf that it was "costate half way" (*Mosses U. S.* 38. *pl.* 4. 1856). In the *Icones* (71. *pl.* 45. 1864), he corrected this mistake, figuring the vein extending into and forming the awn.

Austin made the same mistake about *C. Raui* (*Bull. Torr. Bot. Club*, 6: 46. 1875), describing the leaf with the vein ending below the apex, "costa valida sub apice finienti," yet in the type specimens preserved in his herbarium at Columbia College, the vein is clearly excurrent, forming a terete, white awn, most clearly seen in old abraded leaves when the blade is torn away. He recognized its true character in *C. Wrightii*, for he says of it "costa extending into the much longer, more terete and more scabrous hair point;" yet he failed to see it in his own species. This is the more remarkable, as he had in his herbarium an original sketch of the leaves by E. A. Rau, on the margin of which Mr. Rau had written, "Leaves throughout chlorophyllose, except the long excurrent costa or tip."

In the *Manual* (L. & J. *Mosses of N. Am.* 155, 1884) this mis-

take is repeated and in describing *C. Renauldi* (Bot. Gaz. 15; 41. 1890) M. Cardot cites this as one of the points of difference between these two species, the other being a difference in the teeth. These are described in the Manual as "entire, split or merely perforated here and there on the line of division, erect when moist, open when dry." This is a translation from Austin's original Latin description, but it does not agree with all his specimens. The teeth are very fragile in his species, and are seldom seen entire and unbroken, except on a freshly opened capsule. They are long and slender, perforate at base, three to four parted above, and densely papillose; later they divide into slender divisions, and on old capsules have disappeared altogether, leaving only the annulus. As compared with the figures of *C. Renauldi*, they differ only in not being truncate when perfect. From *C. Wrightii*, as figured in the Icones, these teeth are much longer, more acuminate, the divisions narrower, more slender and regular, the perforations almost continuous above, and splitting into three to four slender divisions to each tooth. The annulus also is not like the mosaic of flat cells figured by Sullivant, there are only two rows of cells instead of three, and the last row has elongated vesicular cells. In the description of *C. Renauldi*, the annulus is not mentioned, nor is it figured in the plate. We have not seen a capsule of this species, but in a recent letter M. Cardot states that the annulus is present, but that he has not been able to determine whether it is persistent or fugacious as all the capsules which he has examined were too young. In the plate the teeth are figured as truncate. M. Cardot says that they were taken from freshly opened capsules, but we are of the opinion that if he were to search in the apex of the lid he would find the remnants of those teeth, as we have found in *C. Raui*, that the tips often fall with the lid, and it was with difficulty that we secured a mount sufficiently perfect for our drawing.

In the description of *C. Renauldi*, M. Cardot states that he has not seen authentic specimens of *C. Raui*, Aust., but this is a mistake, for the specimens I sent him were from Austin's herbarium, labelled Austin by "*Grimmia Raui*, Colorado, Mrs. Roy," and were probably from the same collection as those in the herbarium of E. A. Rau, collected by Brandegees sent by Mr. Rau. These



MOUNTAIN FORM OF DICRANELLA HETEROMALLA.

are the specimens cited by Cardot under *C. Renauldi*, and seem to prove conclusively that the two species are the same.

The specimens collected by J. M. Holzinger on exposed sand bluffs at Winona, Minnesota, have been determined by M. Cardot as *C. Renauldi*, and by me as *C. Ravi*. We also have specimens collected by Mrs. T. A. Williams at Rapid City, South Dakota, which we have referred to this species.

The plate of *C. Ravi* is taken from type specimens in Austin's herbarium sent to him by E. A. Rau, collected by Brandegees.

#### **Description of Plate 248.**

1. Plants natural size; 2. one enlarged; 3. antheridial branch; 4. archegonia branch with the calyptra partially exerted; 5, 6, 7. outlines of leaves; 8. antheridia and bracts; 9. basal half of leaf; 10. apex, showing long rough awn; 11. calyptra; 12. capsule with lid; 13. capsule without lid; 14. old capsule with fragments of teeth; 15. two teeth; 16. annulus; 17. spores.

## **2. DICRANELLA HETEROMALLA AND ITS VARIETIES.**

(PLATE 249.)

According to European authorities this is a very variable species, several of its more striking varieties having received names. The typical form seems to be according to Schimper and Limpricht, the one having the pedicels erect but more or less sinuous. Braithwaite, however, states that the pedicels may be curved, and Boulay says that owing to the variability of the flexion of the pedicel at its summit the capsule assumes very diverse attitudes.

Several of the European varieties have been recognized and distributed in American exsiccatae; but we have been surprised to find that even in this common species there still remain some points to be cleared up, and possibly two allied species to be erased from our lists.

The common lowland form ranging along the Atlantic plain from Newfoundland to Florida, west to Dakota, which grows abundantly along sandy roads in dense cushions at the roots of trees and on dry banks, seems to be typical, having the seta erect, flexuose and glossy yellow, agreeing with European specimens and exsiccatae. It was distributed in Drummond's Mosses, 2d

Ed. No. 54, in Sulliv. & Lesq. Musci Bor. Am. No. 67, and Austin Musci App. No. 79.

DICRANELLA HETEROMALLA ORTHOCARPA (Hedw.).

*Dicranum orthocarpum* Hedw. Sp. Musc. 131. *pl.* 30. 1801.

*Dicranella Fitzgeraldi* Ren. & Card. Bot. Gaz. 13: 197. *pl.* 13. 1888.

This variety is not recognized as distinct by Limpricht, but is given as a synonym of the species, into which it merges insensibly, having the same range. The type locality was at Lancaster, Pennsylvania, but we have not seen the type specimens. The capsule, as the name implies, is not only erect but straight, in the most depauperate forms being so small and black as to suggest *Ditrichum tortile*. This is true of the specimens distributed in Drummond's Southern Mosses as No. 53, and in the original specimens of *D. Fitzgeraldi*, from Florida, as described and figured in the Gazette. M. Cardot has sent us four of these typical specimens; all are old and deoperculate, and represent, in our opinion, a very depauperate state of this variety. Quite recently we have received No. 156 of Ren. & Cardot Musci Am. Sept. collected by J. M. Holzinger at Rock Creek, near Washington, D. C. These specimens are in fine condition, and contradict the original description of *D. Fitzgeraldi* in several points, the old capsules when deoperculate being contracted below the mouth, which is slightly oblique; the walls also are often sulcate, so that we have no hesitation in saying that these are *D. heteromalla* var. *orthocarpa*. They agree with Sull. & Lesq. Musci Bor. Am. No. 68, and Austin Musci Ap. No. 80.

The variety *interrupta* Schimp. has also been recognized and distributed in American exsiccatae, and the var. *stricta* occurs abundantly on decomposing sandstone rocks in the Dells of the Wisconsin. Recently I have made the acquaintance of what may be called the mountain form of this species (Plate 249) for which we have not yet discovered a name, but which we think has been figuring in the Manual as *D. curvata*. It first puzzled me by growing in the dense mats of *Campylopus Virginicus* Aust., raising false hopes that it might be the fruit of this species, which has thus far only been collected sterile. The pedicels were strongly recurved, and the capsules when fresh, ovoid and smooth; but

when dried they changed to the characteristic cinnamon color of *Dicranella heteromalla*, with its twisted mouth and sulcate walls, and the pedicels became erect. These specimens grew at an elevation of 5678 ft. on the summit of White Top, Virginia, on rocky ledges in shade, and were in young fruiting stage on June 26, 1892. Later in the same year, September 29th, I collected a few small plants in the trail up Mt. Marcy, in the Adirondack Mountains, New York. These also were small plants, with plump, ovoid, green capsules and yellow curved seta. But when dried the pedicels became erect, the capsules turned yellow, and showed unmistakably that they were only *Dicranella heteromalla*. It was also found at other points in the vicinity, usually in shade under or on the roots of trees in steep, sloping paths, often in very damp, black soil. Along the roadside, near the Lodge, the pedicels were seldom recurved, though the plants were small. In 1894 the form with recurved pedicels was very abundant both on Mt. Marcy and Mt. McIntyre, and formed large patches at considerable elevation on both these mountains. I had also collected it near Stowe, Vermont, in 1884, and been puzzled by the straightening of the pedicel in drying. In 1893 it was found growing with *Dicranodontium longirostre* on shady sandstone ledges of the Wisconsin Dells, and it surprised me to learn from Dr. Barnes that it was the common form of *Dicranella heteromalla* in that vicinity. It has recently been sent to me by D. A. Burnett, collected in the mountains of Pennsylvania on sandstone rocks at Bradford, associated with *Dicranodontium longirostre*, and it was collected in similar habitat and the same association by Mr. D. A. Hopkins in West Virginia. We also have specimens collected by F. L. Harvey in Maine, by Edwin Faxon on the bridle path at 3,500 feet elevation and on the summit of Mt. Lafayette; also from the Lake of the Clouds on Mt. Washington. Pringle collected it on Mt. Mansfield, Vermont, and A. C. Waghorne in Newfoundland. I find three specimens collected by Austin in 1872 in the White Mountains, which had been sent to T. P. James for determination; accompanying them is an autograph slip from James stating that they "must be a *Dicranum*, but I do not make it *subulatum*."

Now it is a curious fact that *Dicranella curvata*, though reported from two stations in North America, does not occur in any

North American herbarium, as far as we can determine. We have searched diligently for it both in the field and in several collections, and have come to the conclusion that this mountain form of *D. heteromalla* with curved pedicels has been mistaken for it.

It is recorded in the Manual from two localities only:

“On sandstone rocks, Lancaster, Pennsylvania (T. C. Porter), and from the White Mountains (James). Very rare.”

Dr. Porter very kindly sent us a bit of his specimen, and it does not match European specimens of *D. curvata*. It seems referable to depauperate specimens of *D. heteromalla* var. *orthocarpa*. The White Mountain specimens cited have not been found in the herbarium of T. P. James. Macoun does not record it from any locality in Canada, nor have we any other record of its having been collected by anyone else.

### 3. NOTES ON THE GENUS LEERSIA, HEDW.

LEERSIA Hedw. Fund. Musc. 2: 88. 1782.

ENCALYPTA Schreb. Gen. 2: 759. 1791.

This genus is much in need of revision, but we have not been able to take the time to do more than set right two or three glaring mistakes which have come to our notice, in studying the Eastern species, and to call attention to collectors in our Western and Northern States to the importance of securing good and abundant specimens.

There are five species known to occur in the eastern part of the continent, *L. extintoria* (*E. vulgaris*) *L. laciniata* (*E. ciliata*) *L. rhabdocarpa*, *L. procera* and *L. contorta* (*E. streptocarpa*). One of the Eastern species *L. rhabdocarpa* has been found in Quebec, but not yet credited to the United States, it is hoped that it will be found in the mountains of New England if attention is called to the genus.

Of the additions in Macoun's catalogue, *E. subspathulata*, *E. leiomitra*, *E. leiocarpa* and *E. cucullata* are from British Columbia, or Athabasca, and although Prof. Macoun has generously furnished us with all his collection of this genus, and allowed us to keep duplicates, yet we have not felt warranted in taking the time at present to compare the specimens carefully. We have thought it



very important, however, to correct Kindberg's confusing remarks regarding *E. Macounii* Aust. and *E. ciliata* Hedw.

ENCALYPTA MACOUNII AUST. Bot. Gaz. 2: 97. 1877. L. & J. Man. 182, 1884. Macoun's Cat. 6: 94-95 only in part (1892).

The type of this species is preserved in Austin's Herbarium at Columbia College. The specimens are abundant though immature. They have been compared with the original description, which is copied in Lesquereux and James Manual. All the statements but one have been verified; the seta is described as "minutely papillose, rather densely so above the middle." They have been examined with a magnification of 330 diameters, and out of a dozen pedicels on none of them has been found a trace of roughness.

Austin compared it to *E. affinis* Hedw. (*E. apophysata*, N. & H.). We have also made the same comparison with No. 816 of Rabenhorst's Bryotheca Europaea, and find that Austin was right. The calyptra agrees exactly in having pale irregular papillae to the fringed base, though we should call it rather minutely scabrous than "densely papillose." But the leaf characters are also very plain, the margins being strongly revolute, the vein ending below the apex, and very rough on the back with double papillae; the basal cells are clear with the short transverse walls, yellow and thickened into ridges and also papillose. This is true also of *E. affinis*, but the vein in that species is excurrent into an awn. The peristome is described by Austin as "single, the teeth of medium length, very narrow and filiform, red, more or less split into two equal segments, nodulose and granulose." This agrees with the figures of *E. apophysata* in the Bryologia Europaea, but Limpricht says the peristome is double and has a short basal membrane, one-third the length of the teeth, which he figures as 247, page 118. We have been able to detect this in No. 816 of Rab. Byoth. Eu. even when the peristome is old, but not in Austin's specimens. This would add another distinction between *E. apophysata* and *E. Macounii*, though they are evidently closely allied.

The type locality is "On rocks, Stewart's Lake Mountain, B. C., collected by Macoun, June 21, 1875.

On consulting Macoun's Catalogue, I find this locality is not given the first place as it should be, and that the specimens sent

by me from Mount Mackay and Kakabeka Falls, named *E. ciliata*, duplicates of which I have in my herbarium, are also referred to this species. I have re-examined them lately, and still insist that the name I originally gave them is correct. Number 133 of Macoun's Canadian Mosses was distributed as *E. Macounii*, collected "on rocks at Wellington Mine," Vancouver Island, by Macoun. These specimens in our set prove to be *Encalypta vulgaris* var. *pilifera*. If these are the specimens on which Kindberg bases his remarks, it is not surprising that he could not find the characters indicated by Austin.

Under the heading of *E. ciliata* he says (Macoun Cat. 6: 94):

"*Encalypta ciliata* Hedw. and *E. Macounii* Aust. are very difficult to distinguish apart. The descriptions of the best authors are also not consistent." He then quotes from them to show that the position of the teeth does not agree in all the descriptions. From this he says: "It is probable that the authors are confounding both species, also occurring in Europe. *E. ciliata* is principally found in the lower mountain districts. *E. Macounii* seems to be an alpine species also collected by Kindberg in the Norwegian Alps and considered a new species, *E. borealis* Kindb. Laubm. Schwed. & Norweg., but exactly agreeing with the original specimens of *E. Macounii* sent by Prof. Macoun."

It is interesting to know what Norwegian bryologists think about this, and we would refer to the remarks by Chr. Kaurin in the Bot. Centbl. 41: 358 (1890). He states that in the contribution referred to by Kindberg the specimens which were called *Encalypta Macounii* are found to differ from the portion of the type which I sent him.

To continue the quotation from Macoun's Catalogue, page 95:

"The description made by Austin, cited by Lesq. & James, is, however, not completely exact; 'calyptra densely papillose, pedicel reddish, papillose, the leaves muticous;' such characters are not to be found, the calyptra and the yellow pedicel are nearly as smooth as in the true *E. ciliata*, to which the descriptions of the peristome by Schimper and Braithwaite probably belong. The descriptions by Lesq. & James and Boulay could partly be referred to *E. Macounii*, although all authors agree that in the description of *E. ciliata*, 'without a distinct collum;' *E. Macounii* has a distinct collum and the margins of the leaves distinctly reflexed. I possess no specimens of the true *E. ciliata* from North America. It may not occur there."

Now it seems evident from all this that Macoun has sent Kind-

berg a specimen of *Encalypta* closely allied to *E. ciliata*, wrongly named *E. Macounii*, and from this false premise he has arrived at the above conclusions. Whether all the specimens cited in Macoun's Catalogue as *E. Macounii* were sent to Kindberg is not clear, but probably this is not the case. It is likely that only a few of them were, and that the rest have been transferred without examination by Prof. Macoun in making up the list.

We note one that was not transferred, for No. 132 Canadian Mosses is cited under *E. ciliata*, with the label locality reading: "Crevices of rocks, common from Ottawa westward." These specimens have been examined and compared with the types of *E. Macounii*. They are quite distinct in the excurrent vein, plane margins, smooth calyptra, and the mouth bordered by 5-6 rows of hexagonal cells projecting above the base of the teeth. We have also examined all the other specimens in Austin's herbarium sent to him by Macoun and named by Austin *E. ciliata*. These include specimens collected at Stewart's Lake, date and locality the same as type of *E. Macounii*, but distinctly *E. ciliata*; also those from Lake Athabasca, August 29, 1875; Cascades, May 17, 1875; and Hastings county, August, 1874. All of these agree with the characters of *E. ciliata* as described by Limpricht, even to the size of the spores, but in many cases it is difficult to distinguish the preperistome as described by him. The deep projecting border of the mouth is quite distinct, as well as the scattered stomata, with the surrounding cells not differentiated, but long and thickened longitudinally. The neck also is short, but always distinct, and sometimes stomatose, though usually the stomata are above the base of the sporesac.

ENCALYPTA CILIATA (Hedw.) Hoffm.

We find in the Jaeger Herbarium all the exsiccatae cited by Limpricht, and have critically compared No. 19 of his Bryotheca Silesiaca, with our specimens of Macoun's Canadian Mosses No. 132. and Sull. & Lesq. Musci bor. Am. No. 165, Ed. 2. We find they agree in all the characters described, with a certain amount of variation in the length of the awn, and the vein which is also sometimes serrulate on the back for a short distance below the apex of the leaf; the margins are more or less undulate and slightly revolute below, erose papillose above, and the basal cells

are clear and smooth, with the short transverse walls often brown but not projecting. The seta varies somewhat in length, but is smooth and yellow, often red at the junction with the capsule; there is a distinct neck measuring .2 mm., that is the sporesac does not reach the base of the capsule, the stomata are scattered above its base, and the cells of the walls are long and thickened, but not radiating around the stomata; those of the mouth are shorter and hexagonal in 5-6 rows, and project above the base of the orange-red teeth, the last rows falling in fragments with the lid. The beak of the lid is shorter than the capsule, 1-1.5 mm. and the calyptra is fringed at base and generally entirely smooth, though occasionally scabrous at apex. The peristome is erect when dry, and strongly incurved when moist; the teeth are composed of 5-7 joints, and are paler and smoother at apex. Limpricht describes a "preperistome of 32 isolated, smaller, brownish-red plates half the length of the teeth, falling off, or occasionally lacking." We have had great difficulty in distinguishing these plates, both in our specimens and the European ones, but find the teeth are irregularly papillose, that is some joints will be and others not, especially the upper ones, which are generally lighter colored, and presume that is only under very favorable circumstances, on fresh young teeth, that the preperistome can be seen. The *Bryologia Europaea* indicates this in figures 14 and 15, as well as a certain amount of irregularity in the teeth which we have also observed. The spores are quite alike in American and European specimens, in size and the peculiar lines due to shrinking which give them the aspect of a rose-cut diamond with a flat central facet and six radiating around it.

If there are two species mixed under *Encalypta ciliata*, as Kindberg seem to think, we have not yet been able to detect it in American specimens, as compared with authenticated European ones. It has been distributed as Drummond's No. 50 pp. "Rocks and banks along the Mountains," mixed with *E. rhabdocarpa* in Sull. & Lesq. Musci Bor. Am. Ed. 2, No. 165, in Austin's Musci App. No. 174 (1870) and Macoun's Canadian Mosses No. 132. It ranges in the Eastern States from the mountains of New York and New England to Illinois, Wisconsin and Minnesota, Ontario, Quebec, New Brunswick, and north to Greenland. In the

Rocky Mountains from New Mexico to Idaho, also in California, Oregon and Washington, through British Columbia, to Behring sea.

Var. *microstoma* (Bals. & DeNot.) Sch. Br. Eu. Index, p. 7. 1855. *Encalypta microstoma* Bals. & DeNot. Pugill. No. 18. 1836.

We received from the Department of Agriculture specimens collected by Wolf and Rothrock in Colorado, 1873, which agree with the description given by Limpricht of this variety in the short seta, small capsule, with a small mouth, short teeth, lacking on some of the capsules, and the cells of the walls broader and much thickened, with very distinct stomata. The spores, however, seem to be smooth as in the species.

ENCALYPTA LONGIPES Mitt. Journ. Linn. Soc. 8: 29. 1865.

We quote the original description :

Dioica? caule brevi ramoso, foliis patentis concavis ambulate ellipticis acutis paulo supra basin angustatis nervo percurrento obtuse carinatis, margine minute eroso, cellulis basi infima oblongis hyalinis inde viridibus mox abbreviatis quadrato-rotundatis papillois, perichaetialibus parvis vaginulam vix superantibus latissime ovatis acutis theca in pedunculo longissimo rubro ovato-cylindracea basi apophysata, operculo subulato subaequilongo-peristomo dentibus angustis elongatis, calyptra basi nuda apice laevi."

"Seta an inch and a half long, slightly flexuose. Capsule too immature to show if it is furrowed."

Lesquereux and James, in their Manual, on page 183, say in a foot note :

"Upon examination of the specimens of *E. longipes* Mitt. in all of Drummond's sets the characters have been found identical with those of *E. procera*; the plants monoecious; the calyptra papillose, its borders emarginate, erose or fimbriate at base; perichaetial leaves piliferous; capsule spirally striate, etc. The differences that appear in the characters indicated by Mitten result from the unripeness of the specimens he had for examination."

We were permitted by Dr. Watson to examine the type of this species at the time that Mitten's types were still at Cambridge, and we have compared them with the original description and with the above remarks. We can corroborate Mitten's statements, with additional evidence that this is not the same species as *E. procera*.

The calyptra is smooth throughout, and so is the vein of the narrow leaf, which, moreover, as the description says, has a

minutely erose margin, formed of projecting cells which appear smooth, not densely papillose as in *E. procera*. The upper cells of the leaf, in fact, are not papillose but mamillate, projecting on both surfaces of the apex of the leaf, but slightly. Not only is the peristome also described as simple, but a drawing is preserved with the type, showing a single row of teeth, with 2-3 appendiculate basal segments. Kindberg in Macoun's Catalogue says that he too has seen authentic specimens of Drummond's in the collection of Dr. C. Mueller, and states that the "costa is very rough, the calyptra regularly lacinate, very rough and subspinulose above."

It is evident from these remarks, however, that the specimens could not have been authentic, for this is a direct contradiction of the original description, verified by a reëxamination of the type specimen.

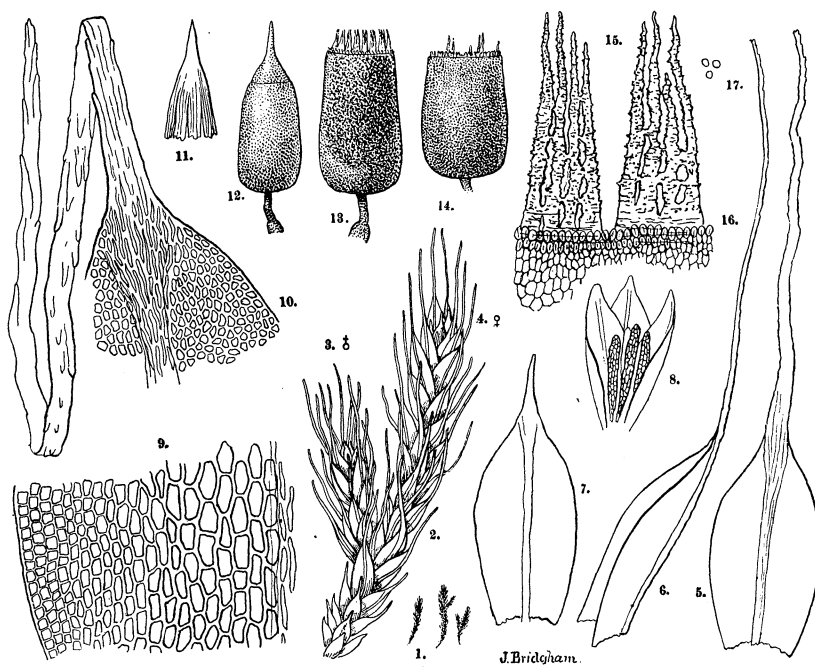
We do not like to venture an opinion without careful comparisons, especially as this species is so meagrely represented in the type, which is also immature, so that it is rather unsatisfactory for purposes of comparison; yet it seems to be very closely related to *E. leiomitra* Kindb., belonging to the group of *E. rhabdocarpa* Schwaeg., from which it differs presumably in its smooth capsule (?), although the original description states that the specimens are too young to show this character.

## Two undescribed Species of Rhynchosia.

BY ANNA MURRAY VAIL.

### RHYNCHOSIA MICHAUXII.

Perennial. Stems prostrate 6-9 dm. or more long, twining above, angled, channelled, clothed, especially on the angles, with a short matted pubescence; stipules 2-5 mm. long, ovate-lanceolate, spreading, persistent; petioles angled, striate, pubescent, 2-4 cm. long, leaves 2.5-5 cm. long, depressed orbicular, much dilated, broader than long, obtuse, sometimes obscurely mucronulate, rugose and minutely hirsute above, sparingly resinous-dotted, reticulated and softly hirsute beneath; the upper ones rarely 3-foliolate with obtuse obliquely sub-orbicular lateral leaflets; racemes 1-several flowered; peduncles 1-2.5 cm. long, angled; calyx 1-1.5 cm. long, pubescent, resinous-dotted, the oblong-lanceolate acuminate



COSCINODON RAUI AUSTIN.